1653

1600

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       RAW SEQUENCE LISTING                  DATE: 11/18/2002
       PATENT APPLICATION:  US/09/469,200D   TIME: 13:01:24

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       Output Set: N:\CRF4\11182002\I469200D.raw

 3 <110> APPLICANT: Weigel, Paul H.
 4         DeAngelis, Paul
 5         Kumari, Kshama
 7 <120> TITLE OF INVENTION: Hyaluronan Synthase Gene and Uses Thereof
 9 <130> FILE REFERENCE: 3554.011
11 <140> CURRENT APPLICATION NUMBER: US 09/469,200D
12 <141> CURRENT FILING DATE: 1999-12-21
14 <150> PRIOR APPLICATION NUMBER: US 09/178,851
15 <151> PRIOR FILING DATE: 1998-10-26
17 <150> PRIOR APPLICATION NUMBER: US 60/064,435
18 <151> PRIOR FILING DATE: 1997-10-31
20 <160> NUMBER OF SEQ ID NOS: 10
22 <170> SOFTWARE: PatentIn version 3.1
24 <210> SEQ ID NO: 1
25 <211> LENGTH: 1254
26 <212> TYPE: DNA
27 <213> ORGANISM: Streptococcus equisimilis
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32 atttacgtca atgtttatct ctttggtgct aaaggaagct tgtcaattta tggctttttg    120
34 ctgatagctt acctattagt caaaatgtcc ttatcctttt tttacaagcc atttaaggga    180
36 agggctgggc aatataaggt tgcagccatt attccctctt ataacgaaga tgctgagtca    240
38 ttgctagaga ccttaaaaag tgttcagcag caaacctatc ccctagcaga aatttatgtt    300
40 gttgacgatg aagtgctga  tgagacaggt attaagcgca ttgaagacta tgtgcgtgac    360
42 actggtgacc tatcaagcaa tgtcattgtt catcggtcag agaaaaatca aggaaagcgt    420
44 catgcacagg cctgggcctt tgaaagatca gacgctgatg tcttttgac  cgttgactca    480
46 gatacttata tctaccctga tgctttagag gagttgttaa aaacctttaa tgacccaact    540
48 gtttttgctg cgacgggtca ccttaatgtc agaaatagac aaaccaatct cttaacacgc    600
50 ttgacagata ttcgctatga taatgctttt ggcgttgaac gagctgccca atccgttaca    660
52 ggtaatatcc ttgtttgctc aggtccgctt agcgtttaca gacgcgaggt ggttgttcct    720
54 aacatagata gatacatcaa ccagaccttc ctgggtattc ctgtaagtat tggtgatgac    780
56 aggtgcttga ccaactatgc aactgattta ggaaagactg tttatcaatc cactgctaaa    840
58 tgtattacag atgttcctga caagatgtct acttacttga agcagcaaaa ccgctggaac    900
60 aagtccttct ttagagagtc cattatttct gttaagaaaa tcatgaacaa tcctttttgta    960
62 gccctatgga ccatacttga ggtgtctatg tttatgatgc ttgtttattc tgtggtggat   1020
64 ttctttgtag gcaatgtcag agaatttgat tggctcaggg ttttagcctt tctggtgatt   1080
66 atcttcattg ttgccctgtg tcggaacatt cattacatgc ttaagcaccc gctgtccttc   1140
68 ttgttatctc cgttttatgg ggtgctgcat ttgtttgtcc tacagccctt gaaattatat   1200
70 tctcttttta ctattagaaa tgctgactgg ggaacacgta aaaaattatt ataa          1254
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74 <211> LENGTH: 417
75 <212> TYPE: PRT
76 <213> ORGANISM: Streptococcus Equisimilis
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81 1               5                   10                  15
84 Trp Val Leu Leu Ile Tyr Val Asn Val Tyr Leu Phe Gly Ala Lys Gly
85               20                  25                  30
88 Ser Leu Ser Ile Tyr Gly Phe Leu Leu Ile Ala Tyr Leu Leu Val Lys
89           35                  40                  45
92 Met Ser Leu Ser Phe Phe Tyr Lys Pro Phe Lys Gly Arg Ala Gly Gln
93        50                  55                  60
96 Tyr Lys Val Ala Ala Ile Ile Pro Ser Tyr Asn Glu Asp Ala Glu Ser
97 65                  70                  75                  80
100 Leu Leu Glu Thr Leu Lys Ser Val Gln Gln Gln Thr Tyr Pro Leu Ala
101               85                  90                  95
104 Glu Ile Tyr Val Val Asp Asp Gly Ser Ala Asp Glu Thr Gly Ile Lys
105               100                 105                 110
108 Arg Ile Glu Asp Tyr Val Arg Asp Thr Gly Asp Leu Ser Ser Asn Val
109           115                 120                 125
112 Ile Val His Arg Ser Glu Lys Asn Gln Gly Lys Arg His Ala Gln Ala
113        130                 135                 140
116 Trp Ala Phe Glu Arg Ser Asp Ala Asp Val Phe Leu Thr Val Asp Ser
117 145                 150                 155                 160
120 Asp Thr Tyr Ile Tyr Pro Asp Ala Leu Glu Glu Leu Leu Lys Thr Phe
121               165                 170                 175
124 Asn Asp Pro Thr Val Phe Ala Ala Thr Gly His Leu Asn Val Arg Asn
125           180                 185                 190
128 Arg Gln Thr Asn Leu Leu Thr Arg Leu Thr Asp Ile Arg Tyr Asp Asn
129        195                 200                 205
132 Ala Phe Gly Val Glu Arg Ala Ala Gln Ser Val Thr Gly Asn Ile Leu
133        210                 215                 220
136 Val Cys Ser Gly Pro Leu Ser Val Tyr Arg Arg Glu Val Val Val Pro
137 225                 230                 235                 240
140 Asn Ile Asp Arg Tyr Ile Asn Gln Thr Phe Leu Gly Ile Pro Val Ser
141               245                 250                 255
144 Ile Gly Asp Asp Arg Cys Leu Thr Asn Tyr Ala Thr Asp Leu Gly Lys
145           260                 265                 270
148 Thr Val Tyr Gln Ser Thr Ala Lys Cys Ile Thr Asp Val Pro Asp Lys
149        275                 280                 285
152 Met Ser Thr Tyr Leu Lys Gln Gln Asn Arg Trp Asn Lys Ser Phe Phe
153        290                 295                 300
156 Arg Glu Ser Ile Ile Ser Val Lys Lys Ile Met Asn Asn Pro Phe Val
157 305                 310                 315                 320
160 Ala Leu Trp Thr Ile Leu Glu Val Ser Met Phe Met Met Leu Val Tyr
161               325                 330                 335
164 Ser Val Val Asp Phe Phe Val Gly Asn Val Arg Glu Phe Asp Trp Leu
165               340                 345                 350
168 Arg Val Leu Ala Phe Leu Val Ile Ile Phe Ile Val Ala Leu Cys Arg
169           355                 360                 365
172 Asn Ile His Tyr Met Leu Lys His Pro Leu Ser Phe Leu Leu Ser Pro
173        370                 375                 380
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RAW SEQUENCE LISTING   DATE: 11/18/2002
PATENT APPLICATION: US/09/469,200D   TIME: 13:01:24

Input Set : A:\sequence listing.txt
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176 Phe Tyr Gly Val Leu His Leu Phe Val Leu Gln Pro Leu Lys Leu Tyr
177 385             390             395             400
180 Ser Leu Phe Thr Ile Arg Asn Ala Asp Trp Gly Thr Arg Lys Lys Leu
181             405             410             415
184 Leu
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189 <211> LENGTH: 22
190 <212> TYPE: DNA
191 <213> ORGANISM: Artificial Sequence
193 <220> FEATURE:
194 <223> OTHER INFORMATION: Primer se1
196 <400> SEQUENCE: 3
197 gctgatgaga caggtattaa gc                                      22
200 <210> SEQ ID NO: 4
201 <211> LENGTH: 20
202 <212> TYPE: DNA
203 <213> ORGANISM: Artificial sequence
205 <220> FEATURE:
206 <223> OTHER INFORMATION: Primer se2
208 <400> SEQUENCE: 4
209 atcaaattct ctgacattgc                                        20
212 <210> SEQ ID NO: 5
213 <211> LENGTH: 20
214 <212> TYPE: DNA
215 <213> ORGANISM: Artificial sequence
217 <220> FEATURE:
218 <223> OTHER INFORMATION: Primer sesp1
220 <400> SEQUENCE: 5
221 gactcagata cttatatcta                                        20
224 <210> SEQ ID NO: 6
225 <211> LENGTH: 17
226 <212> TYPE: DNA
227 <213> ORGANISM: Artificial sequence
229 <220> FEATURE:
230 <223> OTHER INFORMATION: Primer sesp2
232 <400> SEQUENCE: 6
233 tttttacgtg ttcccca                                           17
236 <210> SEQ ID NO: 7
237 <211> LENGTH: 1740
238 <212> TYPE: DNA
239 <213> ORGANISM: Paramecium bursaria chlorella virus
241 <400> SEQUENCE: 7
242 aagacttctt gaaagttaca atgggtaaaa atataatcat aatggtttcg tggtacacca     60
244 tcataacttc aaatctaatc gcggttggag gagcctctct aatcttggct ccggcaatta    120
246 ctgggtatgt tctacattgg aatattgctc tctcgacaat ctggggagta tcagcttatg    180
248 gtattttcgt ttttgggttt ttccttgcac aagtttttatt ttcagaactg aacaggaaac    240
250 gtcttcgcaa gtggatttct ctcagaccta agggttggaa tgatgttcgt ttggctgtga    300
252 tcattgctgg atatcgcgag gatccttata tgttccagaa gtgcctcgag tctgtacgtg    360
254 actctgatta tggcaacgtt gcccgtctga tttgtgtgat tgacggtgat gaggacgatg    420
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256 atatgaggat ggctgccgtt tacaaggcga tctacaatga taatatcaag aagcccgagt    480
258 ttgttctgtg tgagtcagac gacaaggaag gtgaacgcat cgactctgat ttctctcgcg    540
260 acatttgtgt cctccagcct catcgtggaa aacgggagtg tctttatact gggtttcaac    600
262 ttgcaaagat ggaccccagt gtcaatgctg tcgttctgat tgacagcgat accgttctcg    660
264 agaaggatgc tattctggaa gttgtatacc cacttgcatg cgatcccgag atccaagccg    720
266 ttgcaggtga gtgtaagatt tggaacacag acactctttt gagtcttctc gtcgcttggc    780
268 ggtactattc tgcgttttgt gtggagagga gtgcccagtc ttttttcagg actgttcagt    840
270 gcgttggggg gccactgggt gcctacaaga ttgatatcat taaggagatt aaggacccct    900
272 ggatttccca gcgctttctt ggtcagaagt gtacttacgg tgacgaccgc cggctaacca    960
274 acgagatctt gatgcgtggt aaaaaggttg tgttcactcc atttgctgtt ggttggtctg   1020
276 acagtccgac caatgtgttt cggtacatcg ttcagcagac ccgctggagt aagtcgtggt   1080
278 gccgcgaaat ttggtacacc ctcttcgccg cgtggaagca cggtttgtct ggaatttggc   1140
280 tggcctttga atgtttgtat caaattacat acttcttcct cgtgatttac ctcttttctc   1200
282 gcctagccgt tgaggccgac cctcgcgccc agacagccac ggtgattgtg agcaccacgg   1260
284 ttgcattgat taagtgtggg tatttttcat tccgagccaa ggatattcgg gcgttttact   1320
286 ttgtgctttta tacatttgtt tacttttt.ct gtatgattcc ggccaggatt actgcaatga   1380
288 tgacgctttg ggacattggc tggggtactc gcggtggaaa cgagaagcct tccgttggca   1440
290 cccgggtcgc tctgtgggca aagcaatatc tcattgcata tatgtggtgg gccgcggttg   1500
292 ttggcgctgg agtttacagc atcgtccata actggatgtt cgattggaat tctctttctt   1560
294 atcgtttgc tttggttggt atttgttctt acattgtttt tattgttatt gtgctggtgg   1620
296 tttatttcac cggcaaaatt acgacttgga atttcacgaa gcttcagaag gagctaatcg   1680
298 aggatcgcgt tctgtacgat gcaactacca atgctcagtc tgtgtgattt ttcctgcaag   1740
301 <210> SEQ ID NO: 8
302 <211> LENGTH: 2937
303 <212> TYPE: DNA
304 <213> ORGANISM: Pastuerella Multocida
306 <400> SEQUENCE: 8
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309 gactatcaat tagcactcaa attatttgaa aagtcggcgg aaatctatgg acggaaaatt    120
311 gttgaatttc aaaattaccaa atgcaaagaa aaactctcag cacatccttc tgttaattca    180
313 gcacatcttt ctgtaaataa agaagaaaaa gtcaatgttt gcgatagtcc gttagatatt    240
315 gcaacacaac tgttactttc caacgtaaaa aaattagtac tttctgactc ggaaaaaaac    300
317 acgttaaaaa ataaatggaa attgctcact gagaagaaat ctgaaaatgc ggaggtaaga    360
319 gcggtcgccc ttgtaccaaa agattttccc aaagatctgg ttttagcgcc tttacctgat    420
321 catgttaatg attttacatg gtacaaaaag cgaaagaaaa gacttggcat aaaacctgaa    480
323 catcaacatg ttggtctttc tattatcgtt acaacattca atcgaccagc aattttatcg    540
325 attacattag cctgtttagt aaaccaaaaa acacattacc cgtttgaagt tatcgtgaca    600
327 gatgatggta gtcaggaaga tctatcaccg atcattcgcc aatatgaaaa taaattggat    660
329 attcgctacg tcagacaaaa agataacggt tttcaagcca gtgccgctcg gaatatggga    720
331 ttacgcttag caaaatatga ctttattggc ttactcgact gtgatatggc gccaaatcca    780
333 ttatgggttc attcttatgt tgcagagcta ttagaagatg atgatttaac aatcattggt    840
335 ccaagaaaat acatcgatac acaacatatt gacccaaaag acttcttaaa taacgcgagt    900
337 ttgcttgaat cattaccaga agtgaaaacc aataatagtg ttgccgcaaa aggggaagga    960
339 acagtttctc tggattggcg cttagaacaa ttcgaaaaaa cagaaaatct ccgcttatcc   1020
341 gattcgcctt tccgtttttt tgcggcgggt aatgttgctt cgctaaaaa atggctaaat   1080
343 aaatccggtt tctttgatga ggaatttaat cactggggtg gagaagatgt ggaatttgga   1140
345 tatcgcttat tccgttacgg tagtttcttt aaaactattg atggcattat ggcctaccat   1200
347 caagagccac caggtaaaga aaatgaaacc gatcgtgaag cgggaaaaaa tattacgctc   1260
349 gatattatga gagaaaaggt cccttatatc tatagaaaac ttttaccaat agaagattcg   1320
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RAW SEQUENCE LISTING   DATE: 11/18/2002
PATENT APPLICATION: US/09/469,200D   TIME: 13:01:24

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355 tgtaacgatg gttcaacaga taatacctta gaagtgatca ataagcttta tggtaataat 1500
357 cctagggtac gcatcatgtc taaaccaaat ggcggaatag cctcagcatc aaatgcagcc 1560
359 gtttcttttg ctaaaggtta ttacattggg cagttagatt cagatgatta tcttgagcct 1620
361 gatgcagttg aactgtgttt aaaagaattt ttaaaagata aaacgctagc ttgtgtttat 1680
363 accactaata gaaacgtcaa tccggatggt agcttaatcg ctaatggtta caattggcca 1740
365 gaattttcac gagaaaaact cacaacggct atgattgctc accactttag aatgttcacg 1800
367 attagagctt ggcatttaac tgatggattc aatgaaaaaa ttgaaaatgc cgtagactat 1860
369 gacatgttcc tcaaactcag tgaagttgga aaatttaaac atcttaataa aatctgctat 1920
371 aaccgtgtat tacatggtga taacacatca attaagaaac ttggcattca aaagaaaaac 1980
373 cattttgttg tagtcaatca gtcattaaat agacaaggca taacttatta taattatgac 2040
375 gaatttgatg atttagatga aagtagaaag tatattttca ataaaaccgc tgaatatcaa 2100
377 gaagagattg atatcttaaa agatattaaa atcatccaga ataaagatgc caaaatcgca 2160
379 gtcagtattt tttatcccaa tacattaaac ggcttagtga aaaaactaaa caatattatt 2220
381 gaatataata aaaatatatt cgttattgtt ctacatgttg ataagaatca tcttacacca 2280
383 gatatcaaaa aagaaatact agccttctat cataaacatc aagtgaatat tttactaaat 2340
385 aatgatatct catattacac gagtaataga ttaataaaaa ctgaggcgca tttaagtaat 2400
387 attaataaat taagtcagtt aaatctaaat tgtgaataca tcatttttga taatcatgac 2460
389 agcctattcg ttaaaaatga cagctatgct tatatgaaaa aatatgatgt cggcatgaat 2520
391 ttctcagcat taacacatga ttggatcgag aaaatcaatg cgcatccacc atttaaaaag 2580
393 ctcattaaaa cttattttaa tgacaatgac ttaaaaagta tgaatgtgaa aggggcatca 2640
395 caaggtatgt ttatgacgta tgcgctagcg catgagcttc tgacgattat taaagaagtc 2700
397 atcacatctt gccagtcaat tgatagtgtg ccagaatata acactgagga tatttggttc 2760
399 caatttgcac ttttaatctt agaaaagaaa accggccatg tatttaataa aacatcgacc 2820
401 ctgacttata tgccttggga acgaaaatta caatggacaa atgaacaaat tgaaagtgca 2880
403 aaaagaggag aaaatatacc tgttaacaag ttcattatta atagtataac tctataa 2937
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407 <211> LENGTH: 972
408 <212> TYPE: PRT
409 <213> ORGANISM: Pastuerella Multocida
411 <400> SEQUENCE: 9
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418             20                  25                  30
421 Lys Ile Val Glu Phe Gln Ile Thr Lys Cys Lys Glu Lys Leu Ser Ala
422         35                  40                  45
425 His Pro Ser Val Asn Ser Ala His Leu Ser Val Asn Lys Glu Glu Lys
426     50                  55                  60
429 Val Asn Val Cys Asp Ser Pro Leu Asp Ile Ala Thr Gln Leu Leu Leu
430 65                  70                  75                  80
433 Ser Asn Val Lys Lys Leu Val Leu Ser Asp Ser Glu Lys Asn Thr Leu
434             85                  90                  95
437 Lys Asn Lys Trp Lys Leu Leu Thr Glu Lys Lys Ser Glu Asn Ala Glu
438             100                 105                 110
441 Val Arg Ala Val Ala Leu Val Pro Lys Asp Phe Pro Lys Asp Leu Val
442         115                 120                 125
445 Leu Ala Pro Leu Pro Asp His Val Asn Asp Phe Thr Trp Tyr Lys Lys
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VERIFICATION SUMMARY   DATE: 11/18/2002
PATENT APPLICATION: **US/09/469,200D**   TIME: 13:01:25

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